**IN THE CLAIMS:**

The following listing of claims will replace all prior versions, and listings, of claims in the subject application:

**1. (Currently Amended)** A liquid metal evaporation source for use in Molecular Beam Epitaxy (MBE) or vacuum deposition processes, said source comprising:

an evaporator configured to evaporate liquid metal, said evaporator comprising a ~~first~~ hollow cylindrical body from a first end to a second end, said evaporator coupled to a first heater element of a plurality of heater elements maintained at a first temperature for evaporating said liquid metal at said first temperature;

a hollow reservoir cylinder for holding said liquid metal, wherein said hollow reservoir cylinder comprises a cylindrical piston, said reservoir cylinder comprises a third heater element of said plurality of heater elements maintained at a third temperature, wherein said third temperature being lower than said first temperature for holding said liquid metal in a liquid form;

a hollow transport tube for transporting said liquid metal from said hollow reservoir cylinder to said evaporator, wherein said hollow transport tube includes a second heater element of said plurality of heater elements maintained at a second temperature, wherein said second temperature being less than said first temperature and greater than said third temperature, said hollow transport tube connecting said first end and said reservoir cylinder;

a nosecone coupled to said evaporator, said nosecone ~~comprising~~ comprises a ~~second~~ solid cylindrical body~~, at least one annular ring coupled to an external surface of said second cylindrical body and a~~ having a tapered bore from a first opening on said solid cylindrical body adjacent to said liquid metal to a second opening on said solid cylindrical body remote from said

liquid metal, and at least one annular ring coupled to an external surface at said second opening, wherein said nosecone disperses said evaporated liquid metal from said first opening to said second opening; and

at least one conducting probe coupled to said nosecone for regulating a height of said liquid metal within said evaporator, wherein said at least one said conducting probe comprises a ~~third end~~ shaft coupled to said ~~second~~ solid cylindrical body at a third end and a fourth end of said shaft residing between said first opening and a surface of said liquid metal for preventing condensation of said evaporated liquid metal on said ~~second~~ solid cylindrical body;

wherein said evaporator, said hollow reservoir cylinder, and said hollow transport tube form a unitary body machined from a single piece of refractory material;

wherein each of said plurality of heater elements includes a thermocouple configured to sense the temperature and control the temperature of said plurality of heater elements;

wherein said reservoir cylinder and said piston are configured to prevent leakage of liquid metal through the mating surfaces of said reservoir cylinder and said piston;

wherein said at least one conducting probe is configured to sense contact with liquid metal in said evaporator by making a low resistance electrical contact;

wherein said at least one said conducting probe controls a position of said piston in said reservoir cylinder via an automatic feedback control circuit to regulate the level of said liquid metal in said evaporator to maintain a constant evaporation rate of said liquid metal from said evaporator at a fixed evaporator temperature, and controls a position of said piston in said reservoir cylinder to transport said liquid metal from said reservoir cylinder to said evaporator if said conducting probe receives a signal from said automatic feedback control circuit, wherein said signal is indicative of said liquid metal being depleted in said evaporator;

wherein said at least one annular ring is coupled to said second end for sealing said second end to said nosecone; and

wherein said reservoir cylinder, said transport tube, and said evaporator are integrally connected within a vacuum system configured to melt, transport, and evaporate liquid metal at temperatures above the melting point of said liquid metal.

**2. (Original)** An evaporation source according to claim 1, wherein at least one of said evaporator, said hollow transport tube, said reservoir, and said piston are machined from a refractory material.

**3. (Previously presented)** An evaporation source according to claim 2, wherein said refractory material is densified graphite having an efficient black-body radiation absorption, wherein said densified graphite reduces the required heating element power required to achieve a selected operating temperature.

**4. (Original)** An evaporation source according to claim 2, wherein at least one of said evaporator, said reservoir cylinder, said transport tube and said piston are coated with a layer of Pyrolytic Graphite (PG).

**5-7. (Canceled)**

**8. (Previously presented)** An evaporation source according to claim 2, wherein two or more of said evaporator, said hollow transport tube and said reservoir cylinder are machined

from a single piece of refractory material in essentially a concentric configuration with respect to each other.

**9. (Original)** An evaporation source according to claim 1, wherein said evaporator and said hollow transport tube are joined at a right angle to the axis of said reservoir cylinder by leak-tight flat flanges.

**10. (Original)** An evaporation source according to claim 9, wherein said reservoir cylinder is joined to said hollow transport tube and said evaporator via a passageway for said liquid metal.

**11. (Original)** An evaporation source according to claim 9, wherein said leak-tight flat flanges are attached using threaded assemblies.

**12. (Original)** An evaporation source according to claim 9, wherein said leak-tight flat flanges are attached using refractory clamps.

**13. (Original)** An evaporation source according to claim 1, wherein said evaporator and said hollow transport tube are joined at an angle ranging between 0 to 180 degrees to said reservoir cylinder along its axis by leak-tight flanges.

**14. (Original)** An evaporation source according to claim 13, wherein said reservoir cylinder is joined to said hollow transport tube and said evaporator via a passageway for said liquid metal.

**15. (Original)** An evaporation source according to claim 13, wherein said leak-tight flat flanges are attached using refractory clamps.

**16. (Original)** An evaporation source according to claim 13, wherein said leak-tight flat flanges are attached using threaded assemblies.

**17. (Previously presented)** An evaporation source according to claim 15, wherein said refractory clamps are joined together using refractory nuts and bolts preferably made from molybdenum.

**18. (Previously presented)** An evaporation source according to claim 15, wherein said refractory clamps are joined together using refractory nuts and bolts preferably made from densified graphite.

**19. (Currently amended)** An evaporation source according to claim 15, wherein said ~~opening in said cone- shaped vapor orifice~~ bore is conically shaped to provide uniform dispersion of said evaporated metal and deliver uniform thickness deposition of said metal to coat a substrate.

**20. (Canceled)**

**21. (Previously presented)** An evaporation source according to claim 1, wherein at least one said conducting probe is made from a non-reacting refractory material.

**22. (Previously presented)** An evaporation source according to claim 21, wherein said refractory material is densified graphite having an efficient black-body radiation absorption, wherein said densified graphite reduces the required heating element power required to achieve a selected operating temperature.

**23. (Currently amended)** An evaporation source according to claim 22, wherein said at least one conducting probe is insulated from ~~from~~ the walls of the evaporator.

**24. (Original)** An evaporation source according to claim 23, wherein said conducting probes are insulated from each other and insulated from the walls of the evaporator using non-conductive ceramic coating.

**25. (Canceled)**

**26. (Original)** An evaporation source according to claim 24, wherein at least one of said conducting probes is positioned above the surface of said liquid metal.

**27. (Original)** An evaporation source according to claim 24, wherein at least one of said conducting probes is inserted from below the surface of said liquid metal through said evaporator.

**28. (Original)** An evaporation source according to claim 21, wherein at least one of said conducting probes makes a first contact with said liquid metal on its surface and makes a second contact with said liquid metal through conductive walls of said evaporator.

**29. (Previously presented)** An evaporation source according to claim 1, wherein said plurality of heater elements are made from refractory materials.

**30. (Previously presented)** An evaporation source according to claim 29, wherein said refractory material is densified graphite having an efficient black-body radiation absorption, wherein said densified graphite reduces the required heating element power required to achieve a selected operating temperature.

**31. (Previously presented)** An evaporation source according to claim 30, wherein said plurality of heater elements are configured in a serpentine or spiral fashion.

**32-39. (Canceled)**

**40. (Original)** An evaporation source according to claim 1, wherein the position of said piston in said reservoir is manually set.

**41. (Previously presented)** An evaporation source according to claim 40, wherein said position is set using a micrometer screw attached to a linear motion vacuum feedthrough attached to a shaft driving said piston.

**42. (Original)** An evaporation source according to claim 41, wherein the position is set using a motor to drive said micrometer screw.

**43. (Original)** An evaporation source according to claim 1, wherein the position of said piston in said reservoir is automatically adjusted.

**44. (Original)** An evaporation source according to claim 43, wherein the position of said piston is automatically adjusted using an electronic feedback control circuit.

**45. (Previously presented)** An evaporation source according to claim 44, wherein said electronic feedback control circuit senses the electrical contact resistance between said liquid metal and said at least one conducting probe.

**46. (Previously presented)** An evaporation source according to claim 45, wherein said electronic feedback control circuit applies power to a motor that drives a micrometer screw attached to a linear motion vacuum feedthrough attached to a shaft driving said piston.

**47. (Original)** An evaporation source according to claim 1, wherein said refractory material for said source is chosen not to react with said liquid metal at temperatures required to achieve evaporation of said liquid metal.

**48. (Original)** An evaporation source according to claim 1, wherein said liquid metal is selected from the group consisting of Silver (Ag), Aluminum (Al), Gold (Au), Boron (B), Barium (Ba), Bismuth (Bi), Cadmium (Cd), Cobolt (Co), Cesium (Cs), Copper (Cu), Iron (Fe), Gallium (Ga), Gadolinium (Gd), Germanium (Ge), Mercury (Hg), Indium (In), Potassium (K), Lanthanum (La), Lithium (Li), Sodium (Na), Nickel (Ni), Lead (Pb), Palladium (Pd), Praseodymium (Pr), Platinum (Pt), Rubidium (Rb), Antimony (Sb), Scandium (Sc), Selenium (Se), Silicon (Si), Tin (Sn), Tellurium (Te), Thallium (Tl), Vanadium (V), Ytterbium (Y), and Zinc (Zn).

**49. (Currently amended)** A liquid metal evaporation source for use in Molecular Beam Epitaxy (MBE) or vacuum deposition processes for the growth of high purity semiconductor layers, said evaporation source comprising:

a first zone maintained at a first temperature;

a second zone maintained at a second temperature lower than said first temperature; and

a third zone maintained at a third temperature lower than said second temperature; and

a conducting probe to sense a level of a liquid metal in said liquid metal evaporation source; and

a nosecone coupled to said ~~evaporator~~ evaporation source, wherein said nosecone ~~comprising~~ comprises a solid cylindrical body~~, at least one annular ring coupled to an external~~

~~surface of said cylindrical body and~~ including a tapered bore from a first opening adjacent to said liquid metal to a second opening remote from said liquid metal, and wherein said nosecone comprises at least one annular ring coupled to an external surface of said solid cylindrical body at said second opening, wherein said nosecone disperses said evaporated liquid metal from said first opening to said second opening; ~~and~~

wherein said conducting probe comprises a first end coupled to said solid cylindrical body and a second end residing between said first opening and a surface of said liquid metal for preventing condensation of said evaporated liquid metal on said solid cylindrical body;

wherein each of said first, second and third zones include a heater element for sensing and regulating said first, second and third temperatures of said first, second and third zones to prevent solidification of a liquid metal; and

wherein said first, second and third zones are in fluid communication,

wherein said conducting probe transmits a signal to said evaporation source , wherein said signal is indicative of said level of said liquid metal in said evaporation source, wherein said signal is indicative of said level of said liquid metal being below a threshold level,

wherein said first, said second, and said third zones are integrally connected within a vacuum system configured to melt, transport, and evaporate liquid metal at temperatures above the melting point of said liquid metal.

**50. (Currently amended)** An evaporation source according to claim 49, wherein said first zone includes an evaporator, said second zone includes a hollow transport tube, and said third zone includes a reservoir with a piston, and wherein said evaporator, said hollow transport tube, and said reservoir form a unitary body machined from a single piece of material.

**51. (Previously presented)** An evaporation source according to claim 50, wherein at least one of said evaporator, said hollow transport tube and said reservoir is made from refractory material.

**52. (Previously presented)** An evaporation source according to claim 51, wherein heater element regulates said first, second and third temperatures by infrared radiation and wherein said refractory material is densified graphite having an efficient black-body radiation absorption, wherein said densified graphite reduces the required heating element power required to achieve a selected operating temperature.

**53. (Original)** An evaporation source according to claim 52, wherein said refractory material does not react with said liquid metal at temperatures required for evaporation of said liquid metal.

**54. (Original)** An evaporation source according to claim 51, wherein at least one of said evaporator, said hollow transport tube and said reservoir is coated with a layer of material selected from the group consisting of Pyrolytic Graphite (PG), Pyrolytic Boron Nitride (PBN), Pyrolytic Silicon Carbide (PSiC), and Pyrolytic Aluminum Nitride (PAN).

**55. (Previously presented)** An evaporation source according to claim 50, wherein said evaporation source includes at least one conducting probe used to sense contact with liquid metal in said evaporator.

**56. (Previously presented)** An evaporation source according to claim 55, wherein at least one said conducting probe is made from a non-reacting refractory material.

**57. (Previously presented)** An evaporation source according to claim 56, wherein said non-reacting refractory material is densified graphite having an efficient black-body radiation absorption, wherein said densified graphite reduces the required heating element power required to achieve a selected operating temperature.

**58. (Previously presented)** An evaporation source according to claim 57, wherein said at least one said conducting probe is insulated from the walls of said evaporator.

**59. (Currently amended)** An evaporation source according to claim 58, wherein said at least one conducting probe is insulated with ceramic coating ~~is said insulator~~.

**60-62. (Canceled)**

**63. (Original)** An evaporation source according to claim 55, wherein at least one of said conducting probes makes a first contact with said liquid metal on its surface and makes a second contact with said liquid metal through conductive walls of said evaporator.

**64. (Previously presented)** An evaporation source according to claim 63, wherein said at least one conducting probe controls the position of said piston via an automatic feedback control circuit.

**65. (Previously presented)** An evaporation source according to claim 64, wherein said automatic feedback control circuit drives a motor attached to said piston and regulates a constant height of said liquid metal in said evaporator.

**66. (Previously presented)** An evaporation source according to claim 50, wherein two or more of said evaporator, said hollow transport tube, and said reservoir are machined from a single piece of refractory material in essentially a concentric configuration with respect to each other.

**67. (Original)** An evaporation source according to claim 50, wherein said evaporator and said hollow transport tube are joined at a right angle to the axis of said reservoir by leak-tight flat flanges.

**68. (Original)** An evaporation source according to claim 67, wherein said evaporation source includes a co-joining passageway for said liquid metal between said reservoir and said hollow transport tube.

**69. (Original)** An evaporation source according to claim 67, wherein said leak-tight flat flanges are attached using threaded assemblies.

**70. (Original)** An evaporation source according to claim 67, wherein said leak-tight flat flanges are attached using refractory clamps.

**71. (Original)** An evaporation source according to claim 70, wherein said refractory clamps are joined using refractory nuts and bolts.

**72. (Original)** An evaporation source according to claim 50, wherein said evaporator and said hollow transport tube are joined at an angle in the range of 0 to 180 degrees to said reservoir along its axis by leak-tight flanges.

**73. (Original)** An evaporation source according to claim 72, wherein said evaporation source includes a co-joining passageway for said liquid metal between said reservoir and said hollow transport tube.

**74. (Original)** An evaporation source according to claim 72, wherein said leak-tight flat flanges are attached using threaded assemblies.

**75. (Original)** An evaporation source according to claim 72, wherein said leak-tight flat flanges are attached using refractory clamps.

**76. (Original)** An evaporation source according to claim 75, wherein said refractory clamps are joined together using refractory nuts and bolts.

**77. (Currently amended)** An evaporation source according to claim 50, wherein said ~~evaporator includes an evaporator cone-shaped vapor orifice having~~ nosecone comprises at least one said conducting probe disposed therein.

**78. (Currently amended)** An evaporation source according to claim 77, wherein said ~~evaporator cone-shaped vapor orifice~~ nosecone comprises a conically shaped opening configured to provide uniform dispersion of said evaporated metal and deliver a uniform deposition of said metal on a substrate.

**79-80. (Canceled)**

**81. (Previously presented)** An evaporation source according to claim 49, wherein at least one of said heater elements is made from refractory materials.

**82. (Previously presented)** An evaporation source according to claim 81, wherein at least one of said heater elements is configured in a serpentine or spiral fashion.

**83. (Previously presented)** An evaporation source according to claim 49, wherein at least one of said heater elements is densified graphite having an efficient black-body radiation absorption, wherein said densified graphite reduces the required heating element power required to achieve a selected operating temperature.

**84-91. (Canceled)**

**92. (Original)** An evaporation source according to claim 50, wherein the position of said piston in said reservoir is manually set.

**93. (Previously presented)** An evaporation source according to claim 92, wherein said position is set using a micrometer screw attached to a linear motion vacuum feedthrough attached to a shaft driving said piston.

**94. (Original)** An evaporation source according to claim 93, wherein the position is set using a motor to drive said micrometer screw.

**95. (Original)** An evaporation source according to claim 50, wherein the position of said piston in said reservoir is automatically adjusted.

**96. (Original)** An evaporation source according to claim 95, wherein the position of said piston is automatically adjusted using an electronic feedback control circuit.

**97. (Original)** An evaporation source according to claim 96, wherein said electronic feedback control circuit senses the electrical contact resistance between said liquid metal and said conducting probes.

**98. (Previously presented)** An evaporation source according to claim 97, wherein said electronic feedback control circuit applies power to a motor that drives a micrometer screw attached to a linear motion vacuum feedthrough attached to a shaft driving said piston.

**99. (Original)** An evaporation source according to claim 51, wherein said refractory material for said source is chosen not to react with said liquid metal at temperatures required to achieve evaporation of said liquid metal.

**100. (Original)** An evaporation source according to claim 49, wherein said liquid metal is selected from the group consisting of Silver (Ag), Aluminum (Al), Gold (Au), Boron (B), Barium (Ba), Bismuth (Bi), Cadmium (Cd), Cobolt (Co), Cesium (Cs), Copper (Cu), Iron (Fe), Gallium (Ga), Gadolinium (Gd), Germanium (Ge), Mercury (Hg), Indium (In), Potassium (K), Lanthanum (La), Lithium (Li), Sodium (Na), Nickel (Ni), Lead (Pb), Palladium (Pd), Praseodymium (Pr), Platinum (Pt), Rubidium (Rb), Antimony (Sb), Scandium (Sc), Selenium (Se), Silicon (Si), Tin (Sn), Tellurium (Te), Thallium (Tl), Vanadium (V), Ytterbium (Y), and Zinc (Zn).

**101. (Currently amended)** A liquid metal evaporation source for use in Molecular Beam Epitaxy (MBE) or vacuum deposition processes, said evaporation source comprising:

an evaporator for the growth of high purity semiconductor layers, wherein said evaporator comprises a first heater element of a plurality of heater elements for maintaining a first temperature;

a transport tube, said transport tube comprises a second heater element of said plurality of heater elements for maintaining said transport tube at a second temperature;

a reservoir with a piston, wherein said reservoir comprises a third heater element of said plurality of heater elements for maintaining said reservoir at a third temperature, wherein second temperature being less than said first temperature and said second temperature being greater than said third temperature;

a nosecone coupled to said evaporator, wherein said nosecone comprises a solid cylindrical body, at least one annular ring coupled to an external surface of said solid cylindrical body and a tapered bore from a first opening adjacent to said liquid metal to a second opening remote from said liquid metal, wherein said nosecone disperses evaporated liquid metal from said first opening to said second opening; and

at least two conducting probes, a first conducting probe disposed at said evaporator for sensing a height of a liquid metal in said evaporator, and a second conducting probe disposed at said tapered bore for sensing a height of said liquid metal in said orifice;

wherein said evaporator, said reservoir, and said transport tube form a unitary body machined form a single piece of material;

wherein said first conducting probe comprises a first end coupled to said solid cylindrical body and a second end residing between said first opening and said liquid metal for preventing condensation of said evaporated liquid metal on said solid cylindrical body;

wherein said first probe is in thermal communication with said evaporator and said second probe is in thermal communication with said ~~cone-shaped vapor orifice~~ nosecone to maintain said height of said liquid metal in said evaporator, said first and said second probes communicating with said piston to control a flow of said liquid metal to said evaporator,

wherein said first heater element, via a first thermocouple, senses and regulates said first temperature, and wherein said second heater element, via a second thermocouple, senses and maintains a second temperature, and said third heater element, via a third thermocouple, sense and maintains a third temperature,

wherein each of said plurality of heater elements heat said evaporator, said transport tube and said reservoir by infrared radiation to prevent solidification of liquid metal in said evaporator, said transport tube and said reservoir;

wherein said evaporator, said transport tube and said reservoir are in fluid communication; and

wherein said reservoir cylinder, said transport tube, and said evaporator are integrally connected within a vacuum system configured to melt, transport, and evaporate liquid metal at temperatures above the melting point of said liquid metal.

**102. (Previously presented)** An evaporation source according to claim 101, wherein said evaporator is maintained at a temperature for evaporating said liquid metal.

**103. (Previously presented)** An evaporation source according to claim 101, wherein said transport tube is maintained at a temperature lower than said evaporator.

**104. (Previously presented)** An evaporation source according to claim 101, wherein said reservoir is maintained at a lower temperature than said transport tube.

**105. (Previously presented)** An evaporation source according to claim 101, wherein at least one of said evaporator, said transport tube and said reservoir is made from refractory material.

**106. (Previously presented)** An evaporation source according to claim 105, wherein said refractory material is densified graphite having an efficient black-body radiation absorption, wherein said densified graphite reduces the required heating element power required to achieve a selected operating temperature.

**107. (Original)** An evaporation source according to claim 105, wherein said refractory material does not react with said liquid metal at temperatures required for evaporation of said liquid metal.

**108. (Original)** An evaporation source according to claim 101, wherein at least one of said evaporator, said transport tube and said reservoir is coated with a layer of material selected from the group consisting of Pyrolytic Graphite (PG), Pyrolytic Boron Nitride (PBN), Pyrolytic Silicon Carbide (PSiC), and Pyrolytic Aluminum Nitride (PAN).

**109. (Previously presented)** An evaporation source according to claim 101, wherein conducting probes are used to sense contact with liquid metal in said evaporator.

**110. (Previously presented)** An evaporation source according to claim 109, wherein one of said at least two conducting probes is made from a non-reacting refractory material.

**111. (Previously presented)** An evaporation source according to claim 110, wherein said non-reacting refractory material is densified graphite having an efficient black-body radiation absorption, wherein said densified graphite reduces the required heating element power required to achieve a selected operating temperature.

**112. (Original)** An evaporation source according to claim 111, wherein said conducting probes are insulated from each other and insulated from the walls of said evaporator.

**113. (Currently amended)** An evaporation source according to claim 112, wherein said conducting probes are insulated with ceramic coating ~~is said insulator~~.

**114. (Canceled)**

**115. (Previously presented)** An evaporation source according to claim 109, wherein one of said at least two conducting probes is positioned above the surface of said liquid metal.

**116. (Previously presented)** An evaporation source according to claim 109, wherein one of said at least two conducting probes is inserted from below the surface of said liquid metal through said evaporator.

**117. (Previously presented)** An evaporation source according to claim 109, wherein one of said at least two conducting probes makes a first contact with said liquid metal on its surface and makes a second contact with said liquid metal through conductive walls of said evaporator.

**118. (Previously presented)** An evaporation source according to claim 109, wherein one of said at least two conducting probes controls the position of said piston via an automatic feedback control circuit.

**119. (Previously presented)** An evaporation source according to claim 118, wherein said automatic feedback control circuit drives a motor attached to said piston and regulates a constant height of said liquid metal in said evaporator.

**120. (Previously presented)** An evaporation source according to claim 101, wherein two or more of said evaporator, said transport tube, and said reservoir are machined from a single piece of refractory material in essentially a concentric configuration with respect to each other.

**121. (Original)** An evaporation source according to claim 101, wherein said evaporator and said transport tube are joined at a right angle to the axis of said reservoir by leak-tight flat flanges.

**122. (Original)** An evaporation source according to claim 121, wherein said evaporation source includes a co-joining passageway for said liquid metal between said reservoir and said transport tube.

**123. (Original)** An evaporation source according to claim 121, wherein said leak-tight flat flanges are attached using threaded assemblies.

**124. (Original)** An evaporation source according to claim 121, wherein said leak-tight flat flanges are attached using refractory clamps.

**125. (Original)** An evaporation source according to claim 124, wherein said refractory clamps are joined using refractory nuts and bolts.

**126. (Original)** An evaporation source according to claim 101, wherein said evaporator and said transport tube are joined at an angle in the range of 0 to 180 degrees to said reservoir along its axis by leak-tight flanges.

**127. (Original)** An evaporation source according to claim 126, wherein said evaporation source includes a co-joining passageway for said liquid metal between said reservoir and said transport tube.

**128. (Original)** An evaporation source according to claim 126, wherein said leak-tight flat flanges are attached using threaded assemblies.

**129. (Original)** An evaporation source according to claim 126, wherein said leak-tight flat flanges are attached using refractory clamps.

**130. (Original)** An evaporation source according to claim 129, wherein said refractory clamps are joined together using refractory nuts and bolts.

**131. (Currently amended)** An evaporation source according to claim 101, wherein said ~~cone-shaped vapor orifice~~ nosecone comprises a conically shaped opening configured to provide uniform dispersion of said evaporated metal and deliver a uniform disposition of said metal on a substrate.

**132. (Canceled)**

**133. (Previously presented)** An evaporation source according to claim 101, wherein said heater element is made from refractory materials.

**134. (Previously presented)** An evaporation source according to claim 133, wherein said heater element is densified graphite having an efficient black-body radiation absorption, wherein said densified graphite reduces the required heating element power required to achieve a selected operating temperature.

**135. (Previously presented)** An evaporation source according to claim 134, wherein said heater element is configured in a serpentine or spiral fashion.

**136-143. (Canceled)**

**144. (Original)** An evaporation source according to claim 101, wherein the position of said piston in said reservoir is manually set.

**145. (Previously presented)** An evaporation source according to claim 144, wherein said position is set using a micrometer screw attached to a linear motion vacuum feedthrough attached to a shaft driving said piston.

**146. (Original)** An evaporation source according to claim 145, wherein the position is set using a motor to drive said micrometer screw.

**147. (Original)** An evaporation source according to claim 101, wherein the position of said piston in said reservoir is automatically adjusted.

**148. (Original)** An evaporation source according to claim 147, wherein the position of said piston is automatically adjusted using an electronic feedback control circuit.

**149. (Previously presented)** An evaporation source according to claim 148, wherein said electronic feedback control circuit senses the electrical contact resistance between said liquid metal and one of said at least two conducting probes.

**150. (Previously presented)** An evaporation source according to claim 149, wherein said electronic feedback control circuit applies power to a motor that drives a micrometer screw attached to a linear motion vacuum feedthrough attached to a shaft driving said piston.

**151. (Original)** An evaporation source according to claim 101, wherein said refractory material for said source is chosen not to react with said liquid metal at temperatures required to achieve evaporation of said liquid metal.

**152. (Original)** An evaporation source according to claim 101, wherein said liquid metal is selected from the group consisting of Silver (Ag), Aluminum (Al), Gold (Au), Boron (B), Barium (Ba), Bismuth (Bi), Cadmium (Cd), Cobolt (Co), Cesium (Cs), Copper (Cu), Iron (Fe), Gallium (Ga), Gadolinium (Gd), Germanium (Ge), Mercury (Hg), Indium (In), Potassium (K), Lanthanum (La), Lithium (Li), Sodium (Na), Nickel (Ni), Lead (Pb), Palladium (Pd), Praseodymium (Pr), Platinum (Pt), Rubidium (Rb), Antimony (Sb), Scandium (Sc), Selenium (Se), Silicon (Si), Tin (Sn), Tellurium (Te), Thallium (Tl), Vanadium (V), Ytterbium (Y), and Zinc (Zn).

**153. (Original)** An evaporator source according to claim 1, wherein a maximum permissible gap between said reservoir cylinder inner diameter and said piston cylinder outer diameter is configured to contain the liquid metal within said reservoir by the surface tension of the liquid metal and is calculated by the formula:

$$\Delta = \frac{2\gamma}{[\rho g h]},$$

wherein $\Delta$ is the maximum permissible gap;

wherein $\gamma$ is the liquid metal surface tension;

wherein $\rho$ is the density of the liquid metal;

wherein g is the gravitational constant; and

wherein h is the vertical height difference between the liquid metal in the evaporator above the piston surface.

**154. (Original)** An evaporator source according to claim 101, wherein a maximum permissible gap between said reservoir cylinder inner diameter and said piston cylinder outer diameter is configured to contain the liquid metal within said reservoir by the surface tension of the liquid metal and is calculated by the formula:

$$\Delta = \frac{2\gamma}{[\rho g h]},$$

wherein $\Delta$ is the maximum permissible gap;

wherein $\gamma$ is the liquid metal surface tension;

wherein $\rho$ is the density of the liquid metal;

wherein g is the gravitational constant; and

wherein h is the vertical height difference between the liquid metal in the evaporator above the piston surface.

**155. (Currently amended)** An evaporator source according to claim 1, wherein ~~a cone-shaped vapor orifice is disposed at said evaporator to permit~~ said nosecone causes said evaporated metal to escape through an opening in said ~~cone-shaped vapor orifice~~ nosecone, at least one said conducting probe disposed therein.